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Merging regional and global AOD records from major available satellite products

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Satellite instruments provide a vantage point for studying aerosol loading consistently over different regions of the world. However, the typical lifetime of a single satellite platform is on the order of 5-15 years; thus, for climate studies, the use of multiple satellite sensors should be considered.

We introduce a gridded monthly AOD merged product for the period 1995-2017 obtained by combining 12 major available monthly AOD products, which provides a long-term perspective on AOD changes over different regions of the world. Different approaches for merging the individual AOD products (median, weighted according to the evaluation results) are tested. We show that the quality of the merged product is as least as good as that of individual products.

We also introduce an approach to combine the merged AOD product with the AOD time series available over land (TOMS) and ocean (AVHRR) from early 1980th.

The evaluation of the modelled AOD products with the satellite AOD product shows that the agreement between modelled and merged AOD product is closer than one between modelled and individual satellite AOD products.

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